

**In The United States Patent and Trademark Office
On Appeal From The Examiner To The Board
of Patent Appeals and Interferences**

In re Application of: Takeshi (nmi) Hoshida et al.
Serial No.: 09/853,323
Filing Date: May 10, 2001
Group Art Unit: 2613
Confirmation No.: 5870
Examiner: Agustin Bello
Title: Method and System for Transmitting Information in an
Optical Communication System Using Distributed
Amplification

Mail Stop: Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Reply Brief

Appellants respectfully submit this Reply Brief under 37 C.F.R. § 41.41(a)(1) in response to the Examiner's Answer electronically sent January 12, 2007.

Argument

In response to the Examiner's arguments in the Examiner's Answer, Appellants respond as follows.

I. The Examiner's *Kitajima* Rejection of Claims 1-6, 8-9, 11-18, 20-21, 23-24, and 26 is Improper

A. Claims 1, 13, 23 and 26

In the "Response to Argument" section of the Examiner's Answer, the Examiner indicates on page 11 that *Du* teaches that Raman optical amplifiers "have advanced to the point that they are essentially problem free." This is not what *Du* teaches. Instead, *Du* discloses that the general use of a co-propagating Raman amplifier *increases* cross-talk. However, the invention of *Du* is directed at a particular way of reducing this cross-talk when using a co-propagating Raman amplifier to essentially eliminate the cross-talk issues. To do so, *Du* describes specific techniques used to address the cross-talk issues. It does not disclose, teach or suggest that modulating a non-intensity characteristic of an optical carrier signal with a data signal is one such way to address cross-talk.

Similarly, *Kitajima* discloses modulating a non-intensity characteristic of an optical signal, but does not disclose, teach or suggest that one do so when using Raman amplification. In fact, it does not mention Raman amplification.

Therefore, Applicants believe the Examiner is employing hindsight to reconstruct the claimed invention. Because there is no suggestion or motivation to combine the teachings of *Du* and *Kitajima*, Appellants respectfully submit that Claims 1, 13, 23 and 26 are in condition for allowance. Furthermore, the claims that depend from these allowable independent claims (including Claims 2-6, 8-9, 11-12, 14-18, 20-21, and 24) are also in condition for allowance. Therefore, Appellants respectfully request allowance of these claims.

B. Dependent Claims 2 and 14 are Allowable

Claims 2 and 14 recite that the co-launched amplification signal travels at a substantially the same speed as the optical information signal. In the Office Action, the Examiner asserts that since both of these signals are light signals, they travel at the same speed (i.e., “the speed of light”). Appellants previously rebutted this argument by giving the example that different wavelengths of light travel at different speeds in transmission media. Applicants did not intend to limit the claims in any manner using this example, but were merely rebutting the Examiner’s general claim that all optical signals travel at the speed of light. In fact, there might be variations for various reasons, and that it is in this context that the term “substantially” is used in these claims.

In the “Response to Argument” section, the Examiner now argues that he “believes that both the system of Du and that of the claimed invention operate in the same manner in introducing a co-launched amplification signal into a fiber.” Based on this assumption, the Examiner concludes that the limitations of Claims 2 and 14 are disclosed in *Du*. However, it is the Examiner’s burden to show that each and every limitation of the claims is disclosed in the prior art. Applicants submit that it is improper for the Examiner to simply assume that the prior art system works in a particular manner, which just so happens to be the same way that the claimed invention operates. Instead, the Examiner must either show that the limitation is explicitly taught or that it is inherent (which requires that the element necessarily flows from what is disclosed in the prior art). Applicants respectfully submit that the Examiner has not meet these requirements.

Therefore, Appellants respectfully submit that the limitations are Claims 2 and 14 are not taught in the cited references and are not disclosed based on the constant speed of light in a vacuum. For at least this additional reason, Appellants request allowance of Claims 2 and 14.

C. Dependent Claims 11 and 12 are Allowable

Claim 11 recites “further amplifying the signal [the signal that was amplified using co-launch amplification] in the optical link with a discrete amplifier,” and Claim 12 recites that this discrete amplifier is an erbium-doped fiber amplifier (EDFA). Although *Kitajima*

discloses the use of a discrete amplifier and *Du* discloses the use of a Raman amplifier, there is no teaching in either reference of the claimed limitation – amplifying a signal using both types of amplifiers. In the “Response to Argument” section, the Examiner argues that each reference discloses one of the types of amplifiers and that when combined you would thus combine the two types of amplifiers. However, there is no motivation provided in the references or given by the Examiner to combine the use of two different amplifiers. Furthermore, *Kitajima* only discloses the use of a single “generic” amplifier 102 (according to the Examiner). If the Examiner thinks that amplifier 102 is a discrete amplifier (e.g., EFDA), then this is further reason that there is no motivation to use a Raman amplifier in the system of *Kitajima* (relating to Claim 1 arguments). For at least these additional reasons, Appellants respectfully request allowance of Claims 11 and 12.

II. The Examiner’s *Kitajima* Rejection of Claims 7, 10, 19, 22, and 25 is Improper

The Examiner also rejects Claims 7, 10, 19, 22, and 25 under 35 U.S.C. § 103(a) as being unpatentable over *Kitajima* in view of *Du* and further in view of *Ohya*. Claims 7, 10, 19, 22, and 25 are each dependent from one of independent Claims 1, 13, and 23, discussed above. Therefore, at least because they depend from an allowable independent claims, Appellants respectfully request allowance of Claims 7, 10, 19, 22, and 25.

III. The Examiner’s *Bergano* Rejection of Claims 1-5, 7-9, 11-17, 19-21, 23, and 25-26 is Improper

The Examiner also rejects Claims 1-5, 7-9, 11-17, 19-21, 23, and 25-26 under 35 U.S.C. § 103(a) as being unpatentable over *Bergano* in view of *Du*. Appellants respectfully disagree with this rejection for the reasons given below.

A. Independent Claims 1, 13, 23 and 26 are Allowable

First, *Bergano* and *Du* do not disclose each and every limitation of any of the rejected claims. For example, independent Claim 1 recites “modulating a non-intensity characteristic of an optical carrier signal with a data signal to generate an optical information signal.” Independent Claims 13 and 23 recite similar, although not identical, limitations. The Examiner argues that this limitation is disclosed in *Bergano*, which discloses a data

modulator that “that modulates the signal to impart information in a *conventional* manner to produce a modulated optical information signal 103.” *Column 2, lines 28-32* (emphasis added). It also discloses that the data modulator “modulates the optical signal 101 *at a frequency* determined by a clock 106 via a clock signal on line 117.” *Column 2, lines 34-36*. The Examiner argues that this means that frequency modulation is used. However, the fact that the modulator operates at a frequency indicates to Appellants that the frequency is *not* being modulated (since it operates at a particular frequency). In any case, *Bergano* does not specifically disclose that data modulator modulates the data onto the signal using non-intensity modulation, as required by Claims 1, 13, 23 and 26.

Second, there is no suggestion or motivation to combine *Du* and *Bergano*. As with the *Kitajima-Du* combination, the Examiner argues that it would be obvious to modify the system of *Bergano* to add the co-propagating amplifier of *Du* because *Du* indicates the use of a co-launched amplification signal to provide for a reduction of signal-pump-signal cross talk (citing Col 3, lines 31-37). However, as discussed above, *Du* actually discloses that a co-propagating Raman amplifier *increases* cross-talk. *Column 1, lines 21-32*. The invention of *Du* is directed at a way of reducing this cross-talk when using a co-propagating Raman amplifier. Therefore, *Du* certainly does not motivate one to *add* a co-propagating amplifier to reduce cross-talk (instead it discloses how to deal with *increased* cross-talk if a co-propagating amplifier is used). In fact, *Du* teaches away from the use of a co-propagating Raman amplifier except when using those systems specifically disclosed in *Du* (which do not modulate a non-intensity characteristic of an optical signal) since these are the only situations in which *Du* recognizes that the cross-talk created by a co-propagating Raman amplifier is sufficiently reduced.

Therefore, because neither *Du* nor *Bergano* disclose each and every limitation of Claims 1, 13, 23 or 26 and because there is no suggestion or motivation to combine the teachings of *Du* and *Bergano*, Appellants respectfully submit that Claims 1, 13, 23 and 26 are in condition for allowance. Furthermore, the claims that depend from these allowable independent claims (including Claims 2-5, 7-9, 11-12, 14-17, 19-21, and 25) are also in condition for allowance. Therefore, Appellants respectfully request allowance of these claims.

B. Dependent Claims 2 and 14 are Allowable

In addition to depending from an allowable independent claim, the claims dependent from Claims 1, 13, and 23 are also allowable given the additional limitations that these claims recite. For example, dependent Claims 2 and 14 recite that the co-launched amplification signal travels at a substantially the same speed as the optical information signal. For the same reasons provided above with respect to these dependent claims, Appellants respectfully request allowance of Claims 2 and 14.

C. Dependent Claims 11 and 12 are Allowable

Furthermore, dependent Claim 11 recites “further amplifying the signal [the signal that was amplified using co-launch amplification] in the optical link with a discrete amplifier,” and Claim 12 recites that this discrete amplifier is an erbium-doped fiber amplifier (EDFA). For the same reasons provided above with respect to these dependent claims, Appellants respectfully request allowance of Claims 11 and 12.

IV. The Examiner’s *Bergano* Rejection of Claims 6, 10, 18, 22, and 24 is Improper

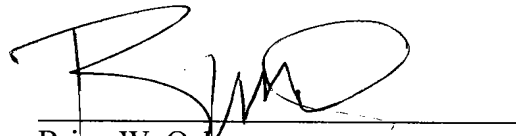
The Examiner also rejects Claims 6, 10, 18, 22, and 24 under 35 U.S.C. § 103(a) as being unpatentable over *Bergano* in view of *Du*, and further in view of *Ohya*. Claims 6, 10, 18, 22, and 24 are each dependent from one of independent Claims 1, 13, and 23, discussed above. Therefore, at least because they depend from an allowable independent claims, Appellants respectfully request allowance of Claims 6, 10, 18, 22, and 24.

Conclusion

Appellants have demonstrated that the present invention, as claimed, complies with all statutory requirements for a U.S. Patent. Therefore, Appellants respectfully request the Board to reverse the final rejection of the Examiner and instruct the Examiner to issue a Notice of Allowance with respect to all pending claims.

Appellants believe no fees are due. Nonetheless, the Commissioner is hereby authorized to charge any fee and credit any overpayment to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,
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